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## Research Request

If you have been stung by a cone shell of any variety, or know of someone who has, please write to me with full details. All responses will be gratefully acknowledged.

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## On Some West American Species of *Calliostoma*

BY

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AT THE CONFERENCE of the Western Society of Malacologists in June, 1974, James Carlton made a plea for more records of field observations on living West Coast mollusks. Returning home from the meeting I found a letter with just that kind of material, from Robert G. Sellers, Jr., graduate student at Hopkins Marine Station. His observations on morphology and habits, especially of *Calliostoma gloriosum* Dall, 1871, should be put on record. He has graciously delegated the privilege to me, suggesting that I combine his notes with any others I might have. Therefore, I am condensing and slightly paraphrasing his two letters in June and July, 1974. I know of no other similar observations except one (unpublished) by Dr. Eugene Coan, who saw a *Calliostoma* in an aquarium devouring a limpet - an act that, unless confirmed by field evidence, might be dismissed as an effect of artificial conditions on an otherwise herbivorous animal.

Mr. Sellers reports that his first specimen of *Calliostoma gloriosum* was from a kelp bed along the wall of Carmel Submarine Canyon at San Jose Creek Beach, on a vertical rock face in 9m of water. It was among other gastropods, mostly *Tegula pulligo* (Gmelin, 1791) and *T. montereyi* (Kiener, 1850). The snail was conspicuous because the shell was covered with a layer of mucus, which blurred many features of its surface. This layer, he thinks, may help prevent incrustation by other organisms because he has seen no *Calliostomas* with a "dirty" shell. A second specimen was in a kelp bed off Cannery Row in about 13½ m of water. Again, the snail was crawling around on a large rock, with a cloudy layer of mucus covering the surface of the shell; two holdfasts of the kelp *Macrocystis* were anchored to the rock. The snail was on a horizontal surface, and there were several *C. ligatum* (Gould, 1849) and *C. annulatum* [Lightfoot, 1786] in its immediate vicinity. The largest populations of *Calliostoma* he saw in two years of diving in the Monterey area were on rocky surfaces within kelp beds. While diving he often saw *C. canaliculatum* [Lightfoot, 1786] on kelp fronds, presumably scraping off the diatom film commonly attached to the kelp. The lower limit of kelp growth in the Monterey

area is  $25\frac{1}{2}$  m, which may also limit the vertical range of *Calliostoma*.

Additional material taken later seems to confirm the mucous sheath as a diagnostic field character of *Calliostoma gloriosum*. Two specimens in  $22\frac{1}{2}$  m off Hopkins both had the mucous covering. Several specimens of *C. annulatum* from this reef had dark blotches on the shells that proved to be a green alga, *Gomontia*, which is restricted to shells of mollusks. No other *Calliostomas* he observed had any incrustation. Both *C. ligatum* and *C. canaliculatum* lack the conspicuous mucous covering and have a less slippery feel than *C. gloriosum*. In the aquarium he observed both to show occasional "wipings" of the shell with the posterior part of the foot. They bent the foot upward and wiped around the shell, presumably to remove foreign material settled on it. Although they have no conspicuous gelatinous sheath, it may well be they deposit a thin layer of mucus on the shell, for they do have a somewhat slippery feel when picked up. This behavior has not been observed in *C. annulatum*, and fresh specimens of that species have no such slippery feel.

The evidence seems to be that the *Calliostomas* are omnivorous, both from observations in the laboratory and in the field. He watched a *Calliostoma annulatum* and a *C. canaliculatum* quickly devour the dead remains of a *Fissurella volcano* Reeve, 1849, that had died in the aquarium. Also in the aquarium he saw a *C. annulatum* engulf a specimen of the dorid *Polycera atra* MacFarland, 1905. While diving last summer, he saw a *C. annulatum* working on the carcass of a fish under the Monterey wharf.

Mr. Sellers, therefore, should be credited with evidence that the presumed herbivores of the genus *Calliostoma* also ingest animal food and that in some species mucous coverings protect the shell from becoming encrusted.

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### A Note on *Ocenebra lurida* (Middendorff)

BY

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FROM INFORMATION obtained at the annual meeting of the Western Society of Malacologists held at Pomona, California, in 1974, I learned that certain molluscan habits I

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had long considered to be well known had never been recorded in print. I present these brief notes in the hope that this will stimulate others with similar field data to bring forward additional unrecorded biological observations on some of our well known and more common species of Pacific Coast Mollusca.

I have collected *Ocenebra lurida* (Middendorff, 1848) from Prince William Sound, Alaska, south to Monterey Bay, California. With few exceptions the species is truly "lurid," reddish brown or reddish purple, through shades of orange to a light yellow. However, on the west coast of Vancouver Island I found a population the members of which were all an ashy grey to an ashy brown, while on the rocky reef area centering on Trinidad Head, California ( $41^{\circ}05'N$ ) the population is an extremely dark brown to black. Whether this coloration is due to diet or to some other biological factor I do not know. I have noted the *Ocenebra* feeding at only one locality and then it was upon the Great Chiton, *Cryptochiton stelleri* (Middendorff, 1846).

At Point Delgado (Shelter Cove) on the northern California coast ( $40^{\circ}01'N$ ), I noted that the girdle of this chiton was often scarred with pits, which had penetrated the brick-red periostracum into the orange flesh covering the valves. One day, just after dawn, I found *Ocenebra lurida* busily devouring the flesh of one of these chitons, but as soon as full day broke, the carnivorous snails immediately sought shelter in the rocky crevices or beneath rocks. Some of the pits in the girdle of the chiton were at least 1 cm in diameter and 3 to 4 mm in depth.

A casual examination of the *Cryptochiton* in the area revealed that probably up to half had been fed upon. Although *Ocenebra interfossa* Carpenter, 1864 and *O. sclera* (Dall, 1919) are present at Shelter Cove, I have never observed them feeding on the Great Chiton, and their coloration is usually dark brown and at times black.

Although pits in the mantle of chitons were noted at Trinidad, and although *Ocenebra lurida* is also present in the same intertidal levels, no definite predator-prey relationship between the two could be established.

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### ANNOUNCEMENT

For Increased Use of a Major Collection  
of Recent Mollusks

The Department of Malacology of the Academy of Natural Sciences of Philadelphia has been supported since 1972 by a grant from the National Science Foundation for the care and maintenance of the collection. We are